

and of sufficient magnitude to be conspicuous, should be made the subject of brief comment.

The following synopses will serve to illustrate what are thought to be satisfactory summaries of the meteorological conditions exhibited on two selected weather maps:

Weather map of 8 a. m., November 8, 1905.

Atmospheric conditions between the Mississippi River and the Rocky Mountains and in the extreme Northwest have remained practically inactive during the past 24 hours. A disturbance is developing over northern Mexico which is resulting in cloudy weather in southern California and Texas and rain in the vicinity of Los Angeles, Cal., and in the upper portion of the Rio Grande Valley. Rain has also fallen during the past 24 hours in the Ohio Valley, the Lake region, New York, and the New England States. No important temperature changes have occurred since yesterday. The weather conditions in the Southwest during the next 36 hours will be controlled by the Mexican disturbance, which will cause cloudy and unsettled weather in this vicinity, with probably showers to-night or Thursday. Higher temperature is indicated for to-night.

Weather map of 8 a. m., November 20, 1905.

A storm of marked intensity appears this morning over the middle Plateau regions, with a trough of low barometric pressure extending from the coast of southern California northeastward to Canada. Pressure has increased considerably over the northeast section of the country and has resulted in much colder weather in the Ohio Valley, the Lake regions, and the New England States. It is increasing rapidly over the north Pacific coast, with a steep barometric gradient, thence southeastward to the middle Plateau regions. Cloudy weather prevails this morning in the Southern States, and light rains have fallen during the past 24 hours in Missouri, southern Texas, California, southern Utah, and in portions of Georgia and Tennessee. Snow was falling this morning in Nevada. The Plateau disturbance will move eastward and will cause southerly winds and higher temperatures in this section during the next 36 hours, followed Tuesday by increasing cloudiness. Fair weather and moderate temperature are indicated for to-night.

RESULTS OF THE WORK DONE AT THE AERONAUTICAL OBSERVATORY OF THE ROYAL PRUSSIAN METEOROLOGICAL INSTITUTE, FROM JANUARY 1, 1903, TO DECEMBER 31, 1904.¹

By STANISLAV HANZLIK, Ph. D. Dated December 2, 1905.

Rapidly following the second volume (see MONTHLY WEATHER REVIEW, December, 1904) appears the third and last publication of this aeronautical observatory as a department of the Royal Meteorological Institute. The observatory has now been separated and transferred as an independent institution, under the title Royal Aeronautical Observatory at Lindenberg, to Lindenberg, 65 kilometers (40.4 miles) southeast of Berlin, in the county of Beeskow-Storkow.

The above-named publication contains, in 188 pages, the results of soundings of the atmosphere during two years, from January 1, 1903, to December 31, 1904. In the first year were made 481, in the second 453 ascents; on every day of this period at least one ascent was made. For economical reasons and on account of the great accumulation of material the results are given in a very condensed form; for the ground, 40 meters (131 feet) above sea level, and 200 meters (656 feet), and 500 meters (1640 feet), and each succeeding 500 meters, and for the greatest height reached. The remarks are very copious. The results are given in extenso only for the days of international ascensions, which are made once a month.

The ascents of elastic rubber balloons were not quite successful in this period, partly because other duties occupied Professor Assmann, who had hitherto personally supervised the work with rubber balloons, and, second, on account of the poor quality of the material used for the rubber balloons. An improvement was made on the rubber balloons by arranging at the bottom of each a trap vent or valve suspended by a line hanging inside of the balloon from the top. When the balloon, filled with hydrogen, ascends and expands, the line stretches more and more till at a certain stage it opens the

valve; then the expanded balloon loses enough gas to close the valve and the balloon falls to the ground with moderate velocity. The advantages of this arrangement are, that knowing how the diameter of the balloon increases with diminishing pressure, we can in advance—by the length of the line—fix the height to which the balloon has to ascend, and, second, the balloon comes down to the ground in most cases unharmed and can be used again. Professor Assmann plans to use this scheme every second day, if possible, at the new observatory in Lindenberg.

The table of the average and maximum heights reached in the years 1903 and 1904 shows the following figures:

	Average height.				Maximum height.			
	1903.	1904.	1903.	1904.	1903.	1904.	1903.	1904.
Kite balloon.....	m. 1,341	m. 1,384	ft. 4,400	ft. 4,541	m. 2,040	m. 2,157	ft. 6,693	ft. 7,077
Kites.....	2,014	2,433	6,603	7,982	4,598	5,100	15,085	16,732

These figures show a great improvement in the skill of the operators. In 1903 and 1904 the kite balloons had to be used in 30 per cent and 39 per cent, respectively, of the cases of all ascensions, on account of poor wind conditions.

The observatory took part in the international ascensions with kites, sounding balloons, and manned balloons; the greatest height reached in 1903 was 8770 meters (28,773 feet) by Professors Berson and von Schrötter.

In connection with this high ascent some interesting remarks are published about the influence of the rarefied air at this height on both mind and body. The observatory took part in the German educational exhibit at St. Louis, in 1904, where it was awarded a grand prize, as has already been reported in the MONTHLY WEATHER REVIEW.

The introduction to this third volume closes with a short paper by Professor Berson on the average and extreme temperature for each 500 meters and an index to all ascensions.

The new Royal Aeronautical Observatory at Lindenberg was opened on the 16th of October, 1905, in the presence of Emperor William II., and high officials, and scientists; among the foreign scientists, Mr. A. L. Rotch and the Prince of Monaco were present, and the latter was awarded the golden medal for science by the Emperor. The Prince of Monaco, assisted by Professor Hergesell, of Strassburg, has lately contributed much to the exploration of the higher strata of the air above the ocean.

HIGHEST KITE ASCENSION.

By Prof. C. F. MARVIN.

Dated Washington, D. C., December 18, 1905.

From a note in *Das Wetter* for November, 1905, p. 262, we learn that an extreme elevation of 6430 meters, or 21,096 feet; that is, almost exactly four miles, was attained at the German Aeronautical Observatory at Lindenberg, by means of a series of six kites. The record from automatic instruments sent up with the kites showed a drop in temperature from 40.8° F., at the ground to -13° at the highest point. The wind velocity in the lower strata was about 18 miles per hour, and at the highest elevation 56 miles per hour.

The Aeronautical Observatory under Doctor Assmann has been in operation only a few years, and yet has made wonderful progress in the meteorological exploration of the upper air by means of kites and balloons. A few years ago it seemed almost as if elevations of from two to two and a half miles were the limiting elevations for kite ascensions. The present accomplishment under Doctor Assmann is the more noteworthy from the fact that the kites were flown on land, where everything depends upon the natural wind. Hereto-

¹ Ergebnisse der Arbeiten am Aëronautischen Observatorium, 1 Januar, 1903, bis 31 December, 1904. Von R. Assmann und A. Berson.